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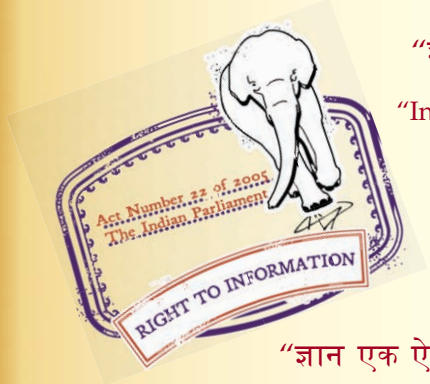
IS 3882 (1966): Tomato ketchup [FAD 10: Processed Fruits and Vegetable Products]



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IS : 3882 - 1966

Indian Standard

(Reaffirmed 2001)

SPECIFICATION FOR TOMATO KETCHUP

(Second Reprint SEPTEMBER 1992)

UDC 664·871·6

BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

Gr 3

February 1967

Indian Standard

SPECIFICATION FOR TOMATO KETCHUP

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Indian Standard

SPECIFICATION FOR TOMATO KETCHUP

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 2 December 1966, after the draft finalized by the Fruits and Vegetables Sectional Committee had been approved by the Agricultural and Food Products Division Council.

0.2 There is usually a glut of tomatoes, when they are in season. Therefore, considerable scope exists for further development of processed tomato products which are in good demand as tomatoes are a rich source of vitamins.

0.3 Tomato ketchup, also known as 'catsup' or 'catchup' occupies an important place among processed tomato products. In view of the popular demand for this product, there is scope for its sophistication by substitution by cheaper raw materials, a practice which should be discouraged. Therefore, in order to ensure the quality of the product and also to build up an increasing demand for it, it is necessary to have strict quality control based on specifications. The formulation of this Indian Standard is expected to help exercise this control.

0.4 In the preparation of this standard, due consideration has been given to the Prevention of Food Adulteration Act, 1954, the Rules framed thereunder and the Fruits Products Order, 1955. This standard is subject to the restrictions imposed under these, wherever applicable.

0.5 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS : 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard prescribes the requirements and the methods of test for tomato ketchup.

2. TERMINOLOGY

2.0 For the purpose of this standard, the following definitions shall apply.

*Rules for rounding off numerical values (*revised*).

2.1 Tomato Juice — Expressed liquid derived from ripe tomatoes containing a minimum of 5 percent by weight of total soluble solids. The tomato juice may contain finely divided insoluble solids from tomato flesh. Common salt, sugar, dextrose, malic acid, ascorbic acid, citric acid and permitted colours may also be added.

2.2 Tomato Ketchup (Sauce) — Preparation from sound and ripe tomatoes with more than 25 percent by weight of total soluble solids. Common salt, spices, sugar, vinegar, onion, garlic and other permitted additives may be added to tomato ketchup.

2.3 Tomato Puree — Concentrated tomato juice containing 9 to 25 percent by weight of total soluble solids. The puree may contain common salt, permitted colours and additives.

2.4 Tomato Paste — Concentrated tomato juice containing more than 25 percent by weight of total soluble solids. The paste may contain added common salt, permitted colours and additives.

2.5 Head Space — The distance between the top of the double seam and the level of the surface of the contents in the container.

2.6 Defects — Presence of seeds, skins, stems, core and other coarse and hard substances.

3. GRADES

3.1 Tomato ketchup shall be of two grades, namely, Grade 1 and Grade 2 (*see* **4.3.1** and Appendix A).

4. REQUIREMENTS

4.1 General — Tomato ketchup shall be derived from sound, fully ripe, wholesome tomatoes. The tomatoes shall be free from insect or fungal attack or any other blemish affecting the quality of the product.

4.1.1 Tomatoes of the following varieties or any other suitable variety may be used for preparing tomato ketchup:

a) Ponderosa,
b) Marglobe,
c) Sioux, and
d) Rutgers.

4.2 Additives — The only substances that may be added to the tomato ketchup are salt, spices, sugar, vinegar, onion, garlic, permitted colours and other approved additives.

4.2.1 No preservative other than benzoic acid shall be used in tomato ketchup. The benzoic acid content shall not exceed 750 ppm when tested according to the method prescribed in Appendix B of IS : 3500-1966*.

4.3 Tomato Ketchup

4.3.1 *Organoleptic Requirements* — The two grades of tomato ketchup shall be as given below:

Grade 1 — The tomato ketchup shall possess good body and consistency, and uniform colour; be practically free from defects; shall have the normal characteristic taste and flavour. It shall score not less than 85 points.

Grade 2 — The tomato ketchup shall possess good body, uniform colour; be reasonably free from defects and shall possess normal characteristic taste and flavour. It shall score not less than 75 points.

The maximum and minimum number of points to be scored through different factors shall be as follows:

	Maximum	*Minimum*	
		Grade 1	Grade 2
Colour	25	19	16
Consistency	25	19	16
Flavour	25	19	16
Absence of defects	25	18	17

4.3.1.1 Scoring shall be done according to the method prescribed in Appendix A.

4.3.2 *Other Requirements* — Tomato ketchup shall also conform to the requirements prescribed in Table 1. The ketchup shall not contain any poisonous metals in excess of the quantities specified in Table 2.

5. PACKING AND MARKING

5.1 Packing — Tomato ketchup shall ordinarily be packed in glass containers, jars or in wooden casks.

5.2 Marking — Each container shall be marked or labelled with the following particulars:

a) Name and grade of the material with the brand name, if any;

b) Name and address of the manufacturer;

c) Net weight of the contents of the container in grams or kilograms;

*Specification for mango chutney.

d) Date of manufacture or code number indicating the date of manufacture;

e) List of additives, if used; and

f) Manufacturer's licence number.

TABLE 1 REQUIREMENTS FOR TOMATO KETCHUP

(*Clause* 4.3.2)

Sl No.	Characteristic	Requirement	Methods of Test, Ref to	
			Appendix	Cl No. of IS : 2860-1964*
(1)	(2)	(3)	(4)	(5)
i)	Total soluble solids, percent by weight, *Min*	25·0	B of this Standard	—
ii)	Specific gravity (Brix), *Min*	1·111 (26°)	—	9
iii)	Acidity, expressed as acetic acid, percent by weight, *Min*	1·2	—	10
iv)	Microbiological requirements	To satisfy the requirements of the test	—	18
v)	Mould count	Not in excess of 40 percent of the fields examined	C of IS : 3881-1966†	—

*Methods of sampling and test for processed fruits and vegetables.

†Specification for tomato juice.

TABLE 2 LIMITS FOR POISONOUS METALS IN TOMATO KETCHUP

(*Clause* 4.3.2)

Sl No.	Characteristic	Requirement	Methods of Test (Ref to Cl No. of IS : 2860-1964*)
(1)	(2)	(3)	(4)
i)	Arsenic (as As), ppm, *Max*	1·1	13
ii)	Lead (as Pb), ppm, *Max*	2·5	14
iii)	Copper (as Cu), ppm, *Max*	30	15
iv)	Zinc (as Zn), ppm, *Max*	19	16
v)	Tin (as Sn), ppm, *Max*	250	17

*Methods of sampling and test for processed fruits and vegetables.

5.2.1 The containers may also be marked with the ISI Certification Mark.

NOTE — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution (Certification Marks) Act, and the Rules and Regulations made thereunder. Presence of this mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard, under a well-defined system of inspection, testing and quality control during production. This system, which is devised and supervised by ISI and operated by the producer, has the further safeguard that the products as actually marketed are continuously checked by ISI for conformity to the standard. Details of conditions, under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

6. SAMPLING

6.1 The method of drawing representative samples of the material and the criteria for conformity shall be as prescribed in 3 of IS : 2860-1964*.

7. TESTS

7.1 The samples of tomato ketchup shall be tested for ascertaining conformity of the material to the requirements of this specification by the methods given in IS : 2860-1964*. Reference to the relevant appendices and clauses of IS : 2860-1964* is given in Tables 1 and 2. The method for determining the mould count shall be as given in Appendix C of IS : 3881-1966†.

APPENDIX A

(*Clause* 4.3.1.1)

DETERMINATION OF THE GRADE OF TOMATO KETCHUP

A-1. APPARATUS

A-1.1 White Porcelain Bowls — big enough to hold the contents of the container under examination.

A-1.2 Stainless Steel Spoons

A-2. PROCEDURE

A-2.1 Panel of Judges — Grades of the product shall be judged by a panel of 3 to 5 judges. All the judges constituting a panel shall be conversant

*Methods of sampling and test for processed fruits and vegetables.

†Specification for tomato juice.

with the factors governing the quality of the product. The containers shall be opened and the contents poured separately into white porcelain bowls. Each judge shall independently examine the contents from each of the containers and assign scores for different characteristics.

A-2.1.1 The judges shall consider the following characteristics : colour, consistency, flavour, and absence of defects.

A-2.2 System of Scoring — The variations within each factor are so described that the scores may be described for each factor and expressed numerically. The relative importance of each factor has been expressed numerically on a scale of 100. Each judge shall give a score for the individual factors, by the method described in Table 3 and record his observations in the score sheet (P 11).

A-2.2.1 The scores as number of points given by the judges for the contents of each container for the four factors shall be recorded in a tabular form in the score card (P 12) and the average score calculated for each factor with overall average for each container entered in the appropriate column (*see* Table 3 and **A-2.3.2**).

A-2.3 Ascertaining the Grade

A-2.3.1 *Agreement Among Judges* — To ascertain uniformity of judgement among the judges, the total score assigned by each of them for the contents of the same container shall be calculated by adding up the scores for the various individual characteristics. If the difference between the maximum and the minimum of the total score so obtained does not exceed ($K + 5$), where K is the number of judges, the scoring shall be deemed as uniform for the container under consideration. If the difference exceeds ($K + 5$), the most outlying score, that is, the one which is farthest from its immediate neighbour (the scores being arranged in one order), shall be discarded and the uniformity among the score cards of remaining judges examined.

A-2.3.2 When the consistency (*see* **A-2.3.1**) is thus established the overall average scores given by the judges whose scoring has been found to be consistent shall be calculated for each container. The average score for each of the individual characteristic shall also be calculated by taking into account the corresponding scores as given by the same judge for the contents of the same container.

A-2.3.3 *Assignment of Grade* — In order to assign a grade for the contents of a container, the following procedure shall be adopted:

Grade 1 — The score for each factor individually shall be not less than 75 percent of the maximum score obtainable, and the overall average score shall be not less than 85 points.

Grade 2 — The score for each factor individually shall be not less than 65 percent of the maximum score obtainable, and the overall average score shall be not less than 75 points.

TABLE 3 METHOD FOR GIVING SCORES FOR TOMATO KETCHUP

(*Clause* A-2.2)

CHARACTERISTIC	DESCRIPTION	MAXIMUM NUMBER OF POINTS
(1)	(2)	(3)
Colour	Good, practically uniform colour; practically free from discolouration (such as blackening of the surface) due to oxidation or other causes, changes normally associated with processing shall not be considered as defects	25
	Good, reasonably uniform colour; reasonably free from discolouration	19
	Indication of developing black discolouration at the surface; colour not characteristic red, tending to be pink	16
Consistency	Good fluid consistency; uniform smooth texture; no tendency for separation of insoluble solids and liquid portions	25
	Reasonably good fluid consistency; reasonably uniform texture; little tendency to separate	19
	Fairly good fluid consistency; some tendency to separate	16
Flavour	Good, characteristic flavour of tomato ketchup; free from scorched burnt or any other objectionable flavour	25
	Reasonably good, characteristic flavour of tomato ketchup; having a slightly scorched taste	19
	Fair flavour; may have smell of being scorched or over burnt, but the product is acceptable	16
Absence of defects	Practically free from defects, such as presence of particles of seeds, skins, dark specks or other hard and coarse extraneous material	25
	Reasonably free from defects; some pieces of seeds or minute pieces of core may be present, not easily discernible to the eye	19
	Some pieces of seeds or pieces of core material readily noticeable on casual examination	17

APPENDIX B

[*Table* 1, *Item* (i)]

DETERMINATION OF TOTAL SOLUBLE SOLIDS (EXCLUSIVE OF SALT)

B-0. GENERAL

B-0.1 The total soluble solids are determined by subtracting the percent by weight of insoluble solids from percent by weight of total solids.

B-1. DETERMINATION OF TOTAL SOLIDS

B-1.1 Apparatus

B-1.1.1 *Flat-Bottom Dishes*

B-1.1.2 *Vacuum Oven*

B-1.2 Procedure — Weigh accurately into a large flat-bottom dish a portion of sample of such size that the dry residue will not be less than 3 to 4 g dry material. Distribute thinly in an even layer over bottom of dish, diluting with water if necessary to facilitate distribution. Dry at 70°C in a vacuum oven under pressure not exceeding 100 mm of mercury until consecutive weighings made at 2-hour intervals do not vary more than 3 mg.

B-1.3 Calculation — From the loss in weight observed, calculate the percent by weight of total solids.

B-2. DETERMINATION OF INSOLUBLE SOLIDS

B-2.1 Wash 20 g of sample repeatedly with hot water, centrifuging after each addition of water and pouring the clear, supernatant liquid through weighed filter or Buchner funnel. (The filter used is one of two such papers dried for 2 hours at 100°C and weighed in a covered dish. The second paper is used if necessary, when first paper becomes clogged.) After 4 or 5 washings, transfer remaining insoluble matter to filter, dry in a covered dish for 2 hours at 100°C. Cool in a desiccator and weigh.

B-2.2 The total soluble solids, percent by weight, will be the difference between percent total solids less the percent insoluble solids.

SCORE SHEET FOR INDIVIDUAL JUDGE

Sample No. .....

Date of Sampling.....

DETAILS OF THE SAMPLE:

a) Product..... b) Name of Manufacturer..... c) Type.....

d) Batch No. ..... e) Date of Manufacture.....

Factors	Score Points	Sample Cans										
		1	2	3	4	5	6	7	8	9	10	11
Colour	Grade 1 19 — 25											
	Grade 2 16 — 18											
Consistency	Grade 1 19 — 25											
	Grade 2 16 — 18											
Flavour	Grade 1 19 — 25											
	Grade 2 16 — 18											
Absence of Defects	Grade 1 19 — 25											
	Grade 2 17 — 18											

Signature of the Judge.....

Date.....

SCORE CARD

Sample No. .....

DETAILS OF THE SAMPLE CAN: Date of Sampling.....

a) Product..... b) Name of Manufacturer..... c) Type.....

d) Batch No. ..... e) Date of Manufacture.....

Factor → / Judge → / Can Number ↓	Colour					Consistency					Flavour					Absence of Defects					Total Scores					Average Score for						Grade of the Can
	A	B	C	D	E	A	B	C	D	E	A	B	C	D	E	A	B	C	D	E	A	B	C	D	E	Colour	Consistency	Absence of Defects	Flavour	Total	

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AMENDMENT NO. 1 MAY 1996
TO
IS 3882 : 1966 SPECIFICATION FOR TOMATO KETCHUP

(*Page* 3, *clause* **0.4**) — Insert the following new clause after **0.4** and renumber the subsequent clause:

'**0.5** A scheme for labelling environment friendly products known as ECO-Mark has been introduced at the instance of the Ministry of Environment and Forests (MEF), Government of India. The ECO-Mark shall be administered by the Bureau of Indian Standards (BIS) under the *BIS Act*, 1986 as per the Resolution No. 71 dated 20 February 1991 and Resolution No. 425 dated 28 October 1992 published in the Gazette of the Government of India. For a product to be eligible for marking with the ECO-Mark it shall also carry the Standard Mark of BIS for quality besides meeting additional environment friendly (EF) requirements. The environment friendly requirements for tomato ketchup are, therefore, included through Amendment No. 1 to this standard.

This amendment is based on the Gazette Notification No. 624 (E) dated 6 September 1995 for Labelling Beverages, Infant Foods, Processed Fruits and Vegetable Products as environment friendly, published in the Gazette of the Government of India.'

(*Page* 5, *clause* **4.3.2**) — Insert the following new matter after **4.3.2**:

'**4.4 Additional Requirements for ECO-Mark**

4.4.1 *General Requirements*

4.4.1.1 The product shall conform to the requirements prescribed under **4.1** to **4.3.2**.

4.4.1.2 The manufacturer shall produce the consent clearance as per the provisions of *Water (PCP) Act*, 1974, *Water (PCP) Cess Act*, 1977 and *Air (PCP) Act*, 1981 along with the authorization if required under *Environment (Protection) Act*, 1986 and the Rules made thereunder to the Bureau of Indian Standards while applying for the ECO-Mark and the product shall also be in accordance with the *Prevention of Food Adulteration Act*, 1954 and the Rules made thereunder. Additionally, FPS 1955 (Fruit Product Order) framed under *Essential Commodities Act*, 1955, *Standards of Weights and Measures Act*, 1977 requirements wherever applicable has to be complied with.

4.4.1.3 The product/packaging may also display in brief the criteria based on which the product has been labelled environment friendly.

4.4.1.4 The material used for product/packing shall be recyclable or biodegradable.

4.4.1.5 The date of manufacture and date of expiry shall be declared on the product/package by the manufacturer.

4.4.1.6 The product shall be microbiologically safe when tested as per IS 5403 : 1969 'Method for yeast and mould count of foodstuffs' and IS 5887 (Part 5) : 1976 'Methods for detection of bacteria responsible for food poisoning : Part 5 Isolation, identification and enumeration of *Vibrio Cholerae* and *Vibrio Parahaemolyticus* (*first revision*)' and shall be free from bacterial and fungal toxins.

4.4.1.7 The pesticide residues, if any in the product shall not exceed the limit as prescribed in *PFA Act*, 1954 and the Rules made thereunder.

4.4.1.8 The product/package or leaflet accompanying it may display instructions of proper use, storage and transport (including refrigeration temperature compliance) so as to maximize the product performance, safety and minimize wastage.

4.4.2 *Specific Requirements*

4.4.2.1 The product shall not contain any of the heavy metal contaminants in excess of the quantities prescribed in Table 2.''

(*Page* 7, *clause* **5.3**) — Insert the following new clause after **5.2.1**:

'5.3 ECO-Mark

The product may also be marked with the ECO-Mark, the details of which may be obtained from the Bureau of Indian Standards.'

(FAD 10)